ABOUT THESE MAPS

Maps a, b and c show the at-sea density (birds/km^2) of Buller's Shearwater (*Puffinus bulleri*) in three ocean seasons – Upwelling, Oceanic, and Davidson Current, displayed in cells of 5' latitude by 5' longitude. Densities are based on the combined data sets of several studies; see the Data and Analyses section of this chapter. The color and mapping intervals were selected to show the most structure and highlight significant areas, while allowing comparisons among marine bird species. Cells that were surveyed but in which no Buller's Shearwaters were observed have a density of zero. Areas not surveyed appear white; no information was available for these areas. Blue lines indicate the boundaries of the National Marine Sanctuaries in the study area: Cordell Bank, Gulf of the Farallones and Monterey Bay. Bathymetric contours for the 200 m and 2,000 m isobaths are shown in light blue.

In order to provide an integrated look at the patterns of a species' spatial and temporal occurrence and abundance in the study area, map d shows seasonal high-use areas, displayed in cells of 10' latitude by 10' longitude, and also breeding colonies (when available). The seasonal high use map provides a further synthesis of densities presented in maps a, b and c, and portrays the relative importance of various areas to the species. Areas with consistently high use are highlighted. See the Data and Analyses section of this chapter for further explanation of high-use areas. Because the sighting data for this species extends significantly beyond the western extent of the standard map frame used in this project, additional maps are provided for this species in Appendix 3F that include a greater western extent.

DATA SOURCES AND METHODS

The at-sea data set is referred to as the CDAS central California data set (1980-2001) and was developed using software called Marine Mammal and Seabird Computer Data Analysis System (CDAS), by the R.G. Ford Consulting Co. The data set extends from Pt. Arena to Pt. Sal in the study area, and the surveys used were conducted between 1980 and 2001. See the Data and Analyses section of this chapter for more information on the at-sea survey data sets and methods.

RESULTS AND DISCUSSION

The Buller's Shearwater is a common species in the study area and reaches its greatest abundance, by far, in waters of the National Marine Sanctuaries, during the Oceanic Season. However, the species did occur in the study area in all three ocean seasons. Surveys in CDAS recorded 601 sightings of 2,804 individuals. This species breeds on islands in the subtropical waters off the North Island of New Zealand. Compared to other shearwaters that occur in the study area, it occurs farther offshore, over the continental slope and beyond.

Insufficient data were available to conduct a regression analysis to indicate habitat features of importance to this species. However, it is attracted to prey that have been forced to the surface by schools of albacore tuna (*Thunnus albacares*). The extent to which the tuna occur near the continental shelf varies from year to year (a function of water temperature), and so does the presence of Buller's Shearwater. Their occurrence was too irregular from year to year for any long-term trends in population numbers to be evident.

Buller's Shearwaters feed mostly on fish (particularly saury) and squid by pursuit plunging and aerial pursuit. Likely they can forage in the subsurface, probably to depths of 10 m. See Tables 3.5, 3.10 and 3.11 for related summary information.